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# Forest Statistics for **NEW YORK** Forest District No. 13



Forest Statistics Series:  
New York No. 13

Northeastern Forest Experiment Station

Upper Darby, Pennsylvania  
Ralph W. Marquis, Director

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## FOREWORD

This is the thirteenth in a series of reports about forest areas and timber volumes in the State of New York. These reports are products of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the nationwide forest survey being made by the Forest Service, U. S. Department of Agriculture.

A similar report has been prepared for each of the other forest districts in the State of New York. The primary purpose of these reports is to provide basic forest statistics for the administrative use of the New York Department of Conservation.

The New York Department of Conservation aided the Northeastern Station greatly in the forest survey of the State. The Department not only provided the aerial photographs used in the survey, but also cooperated in many other phases of the work.

Field work in Forest District No. 13 was supervised by N. B. Griswold. The statistical procedures for obtaining field-inventory data were developed by C. Allen Bickford. Computations were made under the supervision of Roland H. Ferguson.

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# FOREST STATISTICS FOR NEW YORK FOREST DISTRICT NO. 13

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## GENERAL

Forest District No. 13 is located in southeastern New York. It is bounded on the south and west by the New York-New Jersey and Pennsylvania lines. It extends from the Hudson River west through the southern portion of the Catskill Park.<sup>1</sup> The counties included in this district are Orange, Rockland, Sullivan, and Ulster.

The topography in the southern corner is gently rolling, changing to moderately steep slopes and then to the more rugged terrain of the Catskills. About 50 percent of the forest-land area drains into the Hudson River, 40 percent into the Delaware River and south into Pennsylvania, and the remainder into the Passaic River and New Jersey.

The Catskill area of the District is a main source of water for New York City, Philadelphia, and many smaller cities. In addition to its watershed values, the same area is also important for its summer resorts and recreation.

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<sup>1</sup> THE CATSKILL PARK AS SHOWN ON MAPS OF NEW YORK STATE INCLUDES BOTH STATE AND PRIVATE LANDS.

The dominant types of agriculture are dairying, orcharding, and truck farming. Industries are small and diversified. The southern tip of the District includes a part of the suburban area of New York City.

#### *Forest Area*

Forest District No. 13 has a total land area of about 2 million acres. The forest-land area is slightly more than 1,356,000 acres.

Nearly 185,000 acres of the total forest-land area are reserved from timber cutting. Of this, about 136,000 acres are in the State Forest Preserve<sup>2</sup> and 41,000 acres are in State Parks.<sup>3</sup> The acreage of nonproductive forest land is negligible. The remaining 1,171,000 acres are classed as commercial forest land.

Ulster County, the largest in the District, has the greatest amount--38 percent--of the total commercial forest land. Rockland County, the smallest, has only 5 percent.

#### *Ownership*

About 98 percent of the commercial forest land is privately owned. Of this, farmers own nearly one-fifth and other private owners hold four-fifths. A little less than 2 percent is held by the Federal Government at West Point. Municipal ownerships are minor.

#### *Forest Types*

Oak types occupy 41 percent of the commercial forest-land area. The red oak type accounts for nearly one-half of this acreage and the rest is almost equally divided between the chestnut oak and white oak types. The oak types are more prevalent in the southern portion of the District, with chestnut oak occurring on the higher and drier sites. The sugar maple-beech-yellow birch type is found on about 34 percent of the commercial forest area. More common in the northern part of the District, it occupies the better sites. Other hardwood types, principally aspen and ash-elm-maple,

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<sup>2</sup>THE STATE FOREST PRESERVE COMPRISES LANDS OWNED BY THE STATE IN THE 4 FOREST PRESERVE COUNTIES OF THE CATSKILLS AS DEFINED BY LAW.

<sup>3</sup>RECREATIONAL AREAS OUTSIDE THE CATSKILL PARK.

account for 14 percent of the area. Softwood types are found on only 11 percent and, of this, nearly one-half is in the hemlock type and one-fourth in the hard pine types.

#### *Forest Stands*

Sawtimber stands bearing 1,500 board feet or more per acre are present on 35 percent of the commercial forest-land area. Stands of more than 5,000 board feet per acre occupy only 10 percent of the forest land but carry more than one-third of the total board-foot volume.

Poletimber stands occur on 39 percent of the commercial forest land. About 26 percent of the forest area--312,600 acres--is in seedling-and-sapling stands and bears little or no growing stock.

#### *Timber Volume*

The commercial forests contain 1.7 billion board feet (log scale, International  $\frac{1}{4}$ -inch rule) of live sawtimber. Oak species make up 32 percent of the total board-foot volume; sugar maple, beech, and yellow birch about 21 percent; and softwoods--predominantly hemlock and white pine--about 24 percent. Red oaks alone account for 20 percent of the total volume.

The growing stock amounts to 846 million cubic feet. Of this, 368 million are in sawtimber trees and 478 million in poletimber trees. The total cubic volume is equivalent to 10.6 million rough standard cords.

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Table 1.--Land area by major classes, 1950

Class of land <sup>1</sup>	Area	
	<u>Acres</u>	<u>Percent</u>
Forest land:		
Commercial	1,170,900	58
Noncommercial <sup>2</sup>	186,900	9
All forest land	1,357,800	67
Nonforest land	649,200	33
All land <sup>3</sup>	2,007,000	100

<sup>1</sup>See Appendix for definitions.

<sup>2</sup>Includes 138,095.88 acres in the State Forest Preserve, 41,000 acres in State Parks, and 7,000 acres owned by New York City which are reserved from timber cutting. Also included are 800 acres of nonproductive forest land in State Parks. All State ownership figures are as of September 30, 1952.

<sup>3</sup>Census of Agriculture, 1950. Water areas of 1 to 40 acres are included in the estimate of nonforest acreage.

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Table 2.--Land area and commercial forest-  
land area by county, 1950

County	Land area	Commercial forest- land area	
	<u>Acres</u>	<u>Acres</u>	<u>Percent</u>
Orange	530,600	255,400	48
Rockland	113,900	62,600	55
Sullivan	631,000	410,000	65
Ulster	731,500	442,900	61
All	2,007,000	1,170,900	58



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Table 3.--Commercial forest-land area  
by ownership, 1950

Ownership class	Acreage held	
	<u>Acres</u>	<u>Percent</u>
Private:		
Farm forest land <sup>1</sup>	195,800	17
Other private	946,500	81
Total private	1,142,300	98
Public:		
Federal	20,000	2
Municipal	8,600	( <u>2</u> /)
Total public	28,600	2
All ownerships	1,170,900	100

<sup>1</sup>Census of Agriculture, 1950.

<sup>2</sup>Less than 1 percent.

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Table 4.--Commercial forest-land area  
by forest type, 1950

Forest types	Area	
	<u>Acres</u>	<u>Percent</u>
Softwood types	133,500	11
Sugar maple-beech-yellow birch	390,500	34
Red oak	243,100	21
Chestnut oak	133,500	11
White oak	103,800	9
Other hardwood types	166,500	14
All types	1,170,900	100

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Table 5.--Commercial forest-land area by forest-type group  
and stand-size class, 1950

Forest-type group	Saw- timber stands	Pole- timber stands	Seedling-and- sapling stands and other areas	Total area
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Softwood types	77,300	18,800	37,400	133,500
Sugar maple-beech- yellow birch	168,800	143,100	78,600	390,500
Red oak	86,700	113,100	43,300	243,100
Chestnut oak	12,800	84,700	36,000	133,500
White oak	46,300	40,900	16,600	103,800
Other hardwood types	14,100	51,700	100,700	166,500
All types	406,000	452,300	312,600	1,170,900
Percent	35	39	26	100

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Table 6.--Commercial forest-land area by stand-size  
class and watershed, 1950

Stand-size class	Watershed		Total
	Hudson River <sup>1</sup>	Delaware River	
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Sawtimber stands:			
More than 5,000 board feet per acre	83,400	30,100	113,500
1,500 to 5,000 board feet per acre	163,800	128,700	292,500
Poletimber stands:			
More than 600 cubic feet per acre	108,800	102,000	210,800
200 to 600 cubic feet per acre	134,800	106,700	241,500
Better stocked <sup>2</sup> seedling- and-sapling stands	166,000	63,000	229,000
Poorly stocked seedling- and-sapling stands and other areas	29,300	54,300	83,600
Total	686,100	484,800	1,170,900
Percent	59	41	100

<sup>1</sup>Includes the Passaic River watershed--about 8 percent (88,700 acres) of the total commercial forest-land area.

<sup>2</sup>Forty percent or better.

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Table 7.--Net volume of live timber on commercial forest land by species, 1950

Species	Growing stock <sup>1</sup>		Saw-timber <sup>2</sup>
	<u>Thousand cu.ft.</u>	<u>Equivalent in cords</u>	<u>Thousand bd.ft.</u>
Hemlock	86,100	1,076,200	254,300
White pine	31,500	393,700	109,400
Pitch pine	14,400	180,000	53,200
Other softwoods	2,400	30,100	1,500
All softwoods	134,400	1,680,000	418,400
Red oaks	134,500	1,681,200	346,500
Sugar maple	70,700	883,800	176,300
Red maple	135,800	1,697,500	118,900
Beech	45,400	567,500	114,100
White oaks	51,700	646,300	104,200
Chestnut oak	77,700	971,200	97,100
Yellow birch	55,900	698,700	77,300
Ash	26,100	326,200	63,300
Elm	17,300	216,200	32,200
Hickory	13,500	168,800	31,700
Basswood	12,500	156,200	30,400
Yellow-poplar	10,800	135,000	29,900
Black cherry	12,400	155,000	19,500
Aspen	16,700	208,800	6,900
Other hardwoods	30,200	377,600	65,900
All hardwoods	711,200	8,890,000	1,314,200
All species <sup>3</sup>	845,600	10,570,000	1,732,600

<sup>1</sup>Includes sawtimber. Cord equivalent in rough standard cords is assumed to average 80 cubic feet of peeled wood.

<sup>2</sup>Log scale, International  $\frac{1}{4}$ -inch rule.

<sup>3</sup>Excludes the net volume of cull trees--7,200,000 cubic feet.

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Table 8.--Net volume of live timber on commercial  
forest land by diameter class, 1950

Diameter class <sup>1</sup> (in inches at breast height)	Growing stock	Saw- timber
	<u>Thousand cu.ft.</u>	<u>Thousand bd.ft.</u>
Softwoods:		
6	17,800	--
8	20,200	--
10	18,800	60,600
12	18,800	76,100
14	19,500	90,700
16	17,400	82,300
18 +	21,900	108,700
All softwoods	134,400	418,400
Hardwoods:		
6	117,700	--
8	156,000	--
10	165,900	--
12	84,500	345,900
14	68,800	325,200
16	47,600	238,200
18	29,600	161,400
20	18,400	106,700
22	8,800	50,500
24	8,300	50,800
26 +	5,600	35,500
All hardwoods	711,200	1,314,200
Total	845,600	1,732,600

<sup>1</sup>The midpoint of each 2-inch diameter class is indicated.

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Table 9.--Net volume of live timber on commercial forest  
land by forest type, 1950

Forest type	Growing stock		Saw- timber
	<u>Thousand cu.ft.</u>	<u>Equivalent in cords</u>	<u>Thousand bd.ft.</u>
Softwood types	149,600	1,870,000	423,500
Sugar maple-beech- yellow birch	320,500	4,006,200	613,700
Red oak	162,200	2,027,500	351,400
White oak	90,700	1,133,800	183,100
Chestnut oak	67,200	840,000	67,500
Other hardwood types	55,400	692,500	93,400
All types	845,600	10,570,000	1,732,600

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Table 10.--Average net volume of live timber per acre  
of commercial forest land, by  
stand-size class, 1950

Stand-size class (and acreage of each class)	Growing stock	Saw- timber
	<u>Cubic feet</u>	<u>Board feet</u>
Sawtimber stands:		
More than 5,000 bd.ft. per acre (113,500 acres)	1,500	5,700
1,500 to 5,000 bd.ft. per acre (292,500 acres)	1,100	2,600
Poletimber stands:		
More than 600 cu.ft. per acre (210,800 acres)	1,100	800
200 to 600 cu.ft. per acre (241,500 acres)	400	400
Other <sup>1</sup> (312,600 acres)	100	190
Average, all classes <sup>2</sup> (1,170,900 acres)	720	1,480

<sup>1</sup>Includes seedling-and-sapling stands and non-stocked areas.

<sup>2</sup>Hardwoods constitute 76 percent of the total board-foot volume or 84 percent of the total cubic-foot volume in all stand-size classes. The average cubic volume in all stand-size classes is equivalent to 9 cords per acre.



## A P P E N D I X

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### DEFINITIONS OF TERMS

#### *Forest Areas*

Forest-land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre, isolated strips of timber less than 120 feet wide, and abandoned fields and pastures not yet 10 percent stocked are excluded.)

Commercial forest-land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest-land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, and (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions.

#### *Forest Types*

Forest types are classified according to the species or species group that accounts for the major portion of the stand in terms of cubic feet in sawtimber and poletimber stands, or the number of stems in seedling-and-sapling stands.

#### *Stand-Size Classes*

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International  $\frac{1}{4}$ -inch rule.

Poletimber stands.--Stands failing to meet the sawtimber stand specification, but at least 10 percent stocked with poletimber and larger (5.0 inches and larger) trees, and with at least half the minimum stocking in poletimber trees. (Poletimber stands carry at least 200 cubic feet per acre.)

Seedling-and-sapling stands.--Stands not qualifying as either sawtimber or poletimber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling-and-sapling trees.

Other areas.--Forest-land areas not qualifying as sawtimber, poletimber, or seedling-and-sapling stands. (Includes nonstocked areas.)

### *Tree Classes*

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate net volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6.0 inches in diameter inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8.0 inches in diameter inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timbers, or ties.)

Poletimber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for sawtimber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make sawtimber trees eventually.)

Seedling-and-sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

#### *Timber Volume*

Growing stock.--Net volume, in cubic feet, of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

This volume is also given in rough standard cords (bark included). Cord volume is derived from growing stock by applying a factor of 80 cubic feet per cord.

Live sawtimber volume.--Net volume in board feet, International  $\frac{1}{4}$ -inch rule, of live sawtimber trees.

### FOREST - SURVEY METHODS

These forest statistics are based on information gathered from aerial photographs and from sample plots examined on the ground.

First, photo-interpretation plots were marked off on the aerial photographs. These plots were distributed uniformly by mechanical means over photographs of the entire district. Trained photo-interpreters then classified each photo-plot as either forest or nonforest. Forest plots were classified further according to stand-size and forest type.

Field crews inspected some of the photo-plots on the ground. Enough plots were selected at random so as to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots; and the photo classification of stand size and forest type was verified or--if necessary--changed.

The survey was designed for maximum efficiency in estimating total cubic volume to meet the national standards of accuracy.

### ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error. First, photo-interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or record-

ing. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. The size of this sampling error can be measured. In Forest District No. 13 the probabilities are 2 out of 3 that the actual forest area is within  $\pm 1.6$  percent of the estimated forest area, that the actual cubic-foot volume is within  $\pm 4.6$  percent of the estimated cubic-foot volume, and that the actual board-foot volume is within  $\pm 8.7$  percent of the estimated board-foot volume. This does not include any mistakes in measurement or classification.

These percentages show that the area estimates are more accurate than the volume estimates, and that the cubic-foot estimates are more accurate than the board-foot estimates.

In each of the tables, the total figures are more accurate than the subtotals. The subtotals are more accurate than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

#### SPECIES TALLIED

The various commercial tree species tallied in New York Forest District No. 13 are listed below. Approved common names<sup>4</sup> are shown in parentheses if these differ from the brief name used in the tables. Other tree species may occur in the area, but unless they were tallied on the field plots they were not included in the following list.

##### *Softwoods*

Hemlock (Eastern hemlock)	- <u>Tsuga canadensis</u>
White pine (Eastern white pine)	- <u>Pinus strobus</u>
(Red pine)	- <u>Pinus resinosa</u>
Pitch pine	- <u>Pinus rigida</u>
Other softwoods	
(Red spruce)	- <u>Picea rubens</u>

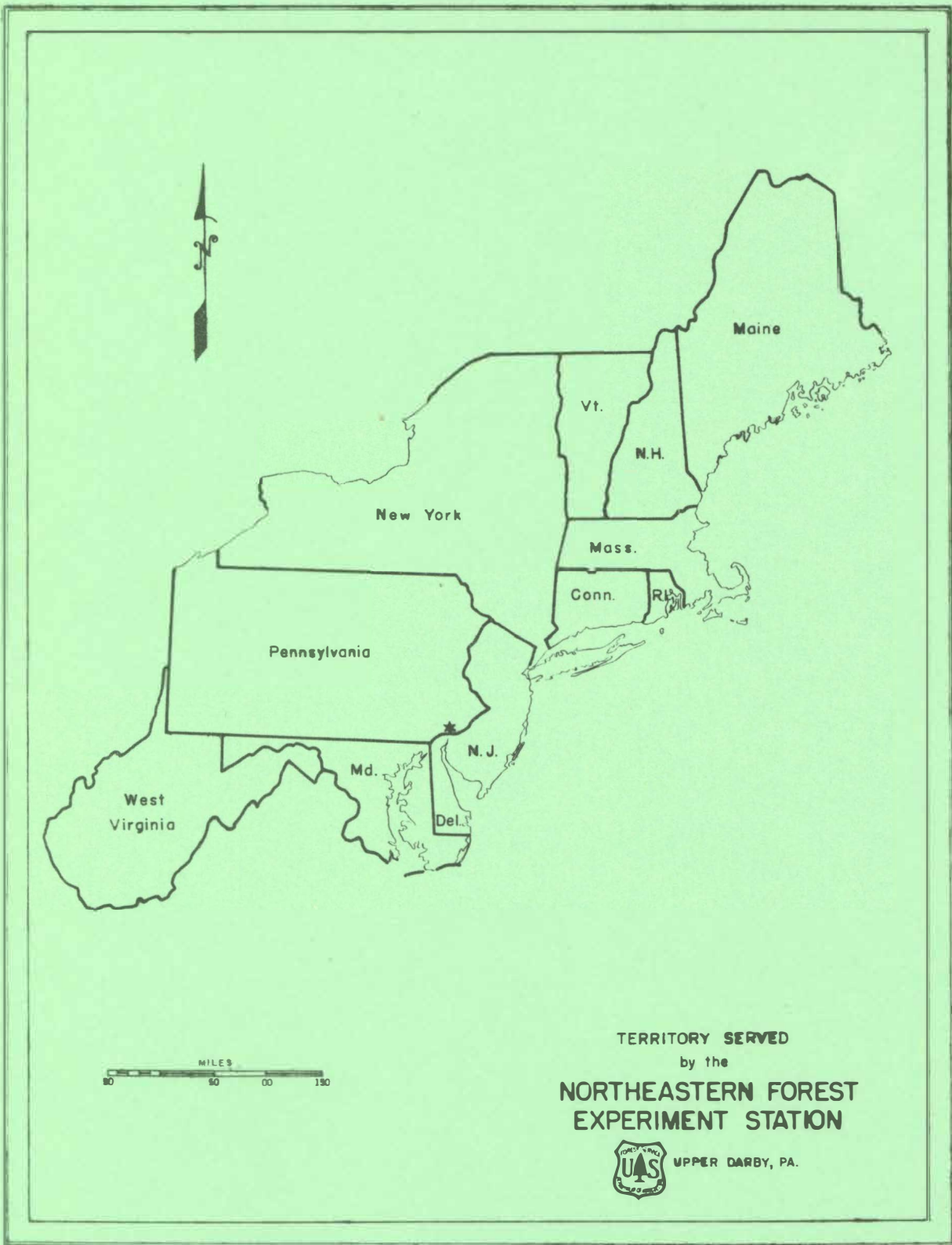
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<sup>4</sup> LITTLE, ELBERT L. JR. CHECK LIST OF NATIVE AND NATURALIZED TREES OF THE UNITED STATES (INCLUDING ALASKA). U.S. DEPT. AGR. AGR. HANDB. 41. 472 PP. 1953.

- |                        |                             |
|------------------------|-----------------------------|
| (Northern white-cedar) | - <u>Thuja occidentalis</u> |
| (Balsam fir)           | - <u>Abies balsamea</u>     |

#### *Hardwoods*

- |                              |                                  |
|------------------------------|----------------------------------|
| Red oaks (Northern red oak)  | - <u>Quercus rubra</u>           |
| (Black oak)                  | - <u>Quercus velutina</u>        |
| (Scarlet oak)                | - <u>Quercus coccinea</u>        |
| Red maple                    | - <u>Acer rubrum</u>             |
| Sugar maple                  | - <u>Acer saccharum</u>          |
| Chestnut oak                 | - <u>Quercus prinus</u>          |
| White oaks (White oak)       | - <u>Quercus alba</u>            |
| (Bur oak)                    | - <u>Quercus macrocarpa</u>      |
| Beech (American beech)       | - <u>Fagus grandifolia</u>       |
| Yellow birch                 | - <u>Betula alleghaniensis</u>   |
| Ash                          | - <u>Fraxinus species</u>        |
| Elm                          | - <u>Ulmus species</u>           |
| Hickory                      | - <u>Carya species</u>           |
| Basswood (American basswood) | - <u>Tilia americana</u>         |
| Yellow-poplar                | - <u>Liriodendron tulipifera</u> |
| Black cherry                 | - <u>Prunus serotina</u>         |
| Aspen                        | - <u>Populus species</u>         |
| Other hardwoods              |                                  |
| (Sweet birch)                | - <u>Betula lenta</u>            |
| (Paper birch)                | - <u>Betula papyrifera</u>       |
| (Sweetgum)                   | - <u>Liquidambar styraciflua</u> |
| (Flowering dogwood)          | - <u>Cornus florida</u>          |



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